Remarks

1. Status of the Claims

Presently pending are claims 1-14, 17, 18, 21-23, and 25-32, of which claims 1, 8, 13 18, and 22 are independent and the remainder are dependent. Claims 1-6, 8-14, 17, 18, 21-23, and 25-27 are currently amended. Claims 28-32 are newly added.

2. Summary of the Office Action

In the final office action mailed November 10, 2009, the Examiner objected to claim 18, rejected claims 1, 2, 4-6, 13, and 22 under 35 USC § 102(e) as being anticipated by U.S. Patent Pub. No. 2002/0163929 (Li), and rejected claims 3, 7-12, 14, 17, 18, 21, 23, and 25-27 under 35 U.S.C. § 103(a) as being unpatentable over Li in view of "PAMAS – Power Aware Multi-Access Protocol with Signaling for Ad Hoc Networks" (Singh).

3. Request for Continued Examination

A Request for Continued Examination under 37 CFR § 1.114 has been included with this response. Accordingly, Applicant requests the withdrawal of the finality of the last Office Action and requests further consideration of the attached amended claims and arguments on the merits.

4. Interview Summary

Applicants thank the Examiner for conducting the Interview on January 5, 2010. During the Interview, Applicants and the Examiner discussed the features and operation of the currently claimed invention, discussed the cited Li and Singh references, and discussed potential amendments to the claims. No agreement was reached.

5. Response to Objection and Rejections

a. The Examiner's objection to claim 8 should be withdrawn

Applicant submits that the Examiner's objection to claim 8 has been obviated by the current amendments to the claims. In light of the forgoing, Applicant respectfully requests that the objection be withdrawn, and claim 8 be allowed to issue.

b. The Li Reference Fails to Anticipate Claims 1, 2, 4-6, 13, and 22

As noted above, the Examiner rejected claims 1, 2, 4-6, 13, and 22 under 35 USC § 102(e) as being allegedly anticipated by Li.

Applicant notes that the Court of Appeals for the Federal Circuit has held that "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Applicant submits that the Li reference fails to anticipate each and every element of the currently claimed invention. While the following arguments focus on amended claim 1, Applicant submits that the same or similar arguments are equally applicable to independent claims 13 and 22, and that claims 13 and 22 are allowable for at least the same reasons set forth below with regard to claim 1.

i. Li fails to disclose a method or apparatus in which a device "determines a first backoff interval by measuring an average wait time" the device "incurred during previous access attempts" and the device "refraining from contending for access to the shared resource" "for at least an interval substantially equal to the first backoff interval."

First, Applicant submits that the Li reference fails to anticipate the claim limitation of claim 1 requiring that a same device "determines a first backoff interval by measuring an average wait time" the device "incurred during previous access attempts" and the device "refraining from

contending for access to the shared resource" "for at least an interval substantially equal to the first backoff interval."

In the Response to Arguments section of the last Office Action, the Examiner contended that the claim limitations did not require that "the time-based backoff period must be uniquely determined for the one station..." While Applicant never contended that the backoff period must be unique across multiple stations, Applicant did contend that the determined first backoff interval obtained by "measuring an average wait time that one of the plurality of stations incurred during previous access attempts" be the same backoff interval that is used in "preventing the one station from contending for access to said shared resource for an interval substantially equal to the first backoff interval." (due to the emphasized antecedent references).

In order to more clearly set forth this requirement, Applicant has amended independent claims 1 and 8 to more specifically require that it is the same first station that determines a first backoff interval "by measuring an average wait time that the first station incurred during a plurality of previous access attempts..." and that "the first station refrain[s] from contending for access to said shared resource for at least an interval substantially equal to the first backoff interval." (emphasis added).

Applicant submits that independent apparatus claims 13, 18, and 22 already required as much, and therefore have not been similarly amended. More specifically, while the Examiner addressed claims 1, 13, and 22 together in the last Office Action, the Examiner only specifically set forth arguments with regard to the method claim 1. (See page 6 of the Office Action). In contrast, independent claims 13 and 22, due to the structure of the apparatus claims, already require that each individual station calculate its own first backoff interval by "measuring an average time that the transmitter incurred during a plurality of previous attempts to access the

shared resource..." and that the station processor is configured "to cause the apparatus to refrain from contending for access to said shared resource for at least an interval substantially equal to the first backoff interval."

In contrast to the foregoing, Li discloses an "access point that estimates" a number of "collisions" experienced by client stations "attempting to make a reservation in the same reservation slot." (emphasis added, see paragraphs [0032-0035]). The estimated number of collisions may then be used by "the collision resolution device 30" in the access point to "recalculate the back-off window in accordance with the fixed collision rate (FCR) algorithm...to maintain a substantially constant collision rate of 1-2/e and thereby maximize throughput." (See paragraphs [0034-0035]).

Accordingly, even if Applicant were to concede to the Examiner's assertion on page 3 of the Office Action that the claim term "average wait time" would include "a measurement of network throughput," the access point of Li measures network throughput by measuring collisions incurred by other stations, not by itself. In contrast, the amended claims 1 and 8 and un-amended claims 13, 18, and 22 require that each station (or access point for some of the claims) determine its own backoff interval "by measuring an average wait time that the first station incurred during a plurality of previous access attempts..." and that "the first station refraining from contending for access...for at least an interval substantially equal to the first backoff interval."

ii. Li fails to disclose "refraining from contending for access to the shared resource" "for at least an interval substantially equal to the first backoff interval."

Second, Applicant submits that the Li reference fails to anticipate the claim limitation of claim 1 requiring that the station "refrain from contending for access to the shared resource" "for

at least an interval substantially equal to the first backoff interval." Although the Examiner's cites to Li's disclosure of a "backoff interval" on page 6, lines 7-17 of the last Office Action, the Li reference never discloses a backoff interval, but rather merely discloses the calculation and variation of a backoff window. As set forth in each of the pending independent claims, the currently claimed backoff interval determines a minimum interval during which the station "refrains from contending for access to the shared resource."

In contrast, the operation of the backoff window is defined in paragraph [0011] of Li as an interval in which, "if the transmitting user detects a collision, it re-transmits k slots later, where k is a random integer number uniformly distributed over the interval [1, 2.sup.i]. The interval over which the uniformly distributed number is drawn is hereafter referred to as the back-off window." (Emphasis added).

Paragraph [0005] of Applicant's disclosure provides a similar definition, stating that "Station 101-1 chooses randomly the number of backoff slots that it must wait between zero and a contention window parameter value." The backoff "window" thus defines a maximum backoff interval within which the station will transmit a frame. The backoff "interval," as set forth in the claims, is instead "an interval" during which a "first station refrain[s] from contending for access to said shared resource."

Accordingly, Li explicitly teaches a re-transmission within the defined "backoff window." In contrast, and as clearly set forth in each of the independent claims, the currently claimed station "refrains from transmitting for at least an interval substantially equal to the first backoff interval." Accordingly, the currently claimed "backoff interval" and Li's "backoff window" are simply not analogous elements.

iii. The Examiner has failed to provide any evidence to support the assertion that "the successful transmission ratio of the network would determine the amount of time that a station would have to wait for successful access."

The Examiner, on page 3, lines 12-15 of the last Office Action, argued that "the successful transmission ratio of the network would determine the amount of time that a station would have to wait for successful access." Applicant notes that the Examiner has failed to set forth any evidentiary support for this assertion. While network throughput may provide some ambiguous indication of a relative amount of time that stations may wait to access the shared medium (in comparison to other values of network throughput), Applicant submits that actual wait times (and thus an "average wait time") experienced by a station during a plurality of previous access attempts can not be determined based solely on obtained network throughput information.

In other words, the claims require "measuring an average wait time" experienced by a station "during a plurality of previous access attempts." They do not more generally require obtaining some indication that may (or may not) be indicative of wait times experienced by a station in obtaining access to the shared medium. Under M.P.E.P. §2144.03(c), Applicant respectfully requests Examiner assert valid evidence to support the assertion, or that the assertion be withdrawn and the rejection of claims 1, 2, 4-6, 13, and 22 be similarly withdrawn.

iv. Li fails to disclose the additional limitations of claim 4.

Specifically regarding claim 4, and in addition to the arguments set forth above, Applicant submits that paragraphs [0059] and [0060] fail to disclose that the backoff interval is based on "a moving average." As set forth above, the cited paragraphs of Li are directed to a method of calculating an actual collision rate relative to a preferred collision rate, and modifying a backoff window applied to all stations in the network in order to move the actual collision rate

closer to the preferred collision rate. The Li reference fails to disclose anything regarding a moving average being used in determining the backoff window.

The Examiner stated in the Response to Arguments section at the top of page 3 of the November 10, 2009 Office Action that "Li further fails to teach the limitations of dependent claims 4-6, 13, and 22 for similar reasons to the above." The "reasons noted above," however, failed to address any of the added limitations of dependent claim 4.

Applicants respectfully submit that the Examiner's failure to address any of the additional limitations of dependent claim 4, and the Arguments set forth by the Applicant in the June 25, 2009 Response, does not meet the requirements of M.P.E.P. § 707.07(f) and 37 C.F.R. § 1.104, which state that the Examiner "must provide clear explanations of all actions taken by the examiner during prosecution of an application" and "where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it."

For at least this reason also, Applicant submits that the Examiner has failed to assert a proper rejection under 35 U.S.C. § 102, and that claim 4 should be allowed to issue.

v. Li fails to disclose the additional limitations of claim 5.

Specifically regarding claim 5, and in addition to the arguments set forth above, Applicant submits that paragraphs [0014]-[0016], figure 5, and paragraphs [0059]-[0064] fail to disclose "the first station refraining from contending for access to the shared resource for a second random backoff period beyond said first determined backoff period." (emphasis added).

The Examiner stated in the Response to Arguments section at the top of page 3 of the November 10, 2009 Office Action that "Li further fails to teach the limitations of dependent claims 4-6, 13, and 22 for similar reasons to the above." The "reasons noted above," however, failed to address any of the added limitations of dependent claim 5.

Applicants respectfully submit that the Examiner's failure to address any of the additional limitations of dependent claim 5, and the Arguments set forth by the Applicant in the June 25, 2009 Response, does not meet the requirements of M.P.E.P. §707.07(f) and 37 C.F.R. §1.104, which state that the Examiner "must provide clear explanations of all actions taken by the examiner during prosecution of an application" and "where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it."

For at least this reason also, Applicant submits that the Examiner has failed to assert a proper rejection under 35 U.S.C. § 102, and that claim 5 should be allowed to issue.

vi. Li fails to disclose the additional limitations of claim 6.

Specifically regarding claim 6, and in addition to the arguments set forth above, Applicant submits that paragraphs [0014]-[0016], figure 5, and paragraphs [0059]-[0064] fail to disclose "wherein said second random backoff period assumes a nonzero value only after an unsuccessful attempt to transmit occurs."

The Examiner stated in the Response to Arguments section at the top of page 3 of the November 10, 2009 Office Action that "Li further fails to teach the limitations of dependent claims 4-6, 13, and 22 for similar reasons to the above." The "reasons noted above," however, failed to address any of the added limitations of dependent claim 6.

Applicants respectfully submit that the Examiner's failure to address any of the additional limitations of dependent claim 6, and the Arguments set forth by the Applicant in the June 25, 2009 Response, does not meet the requirements of M.P.E.P. § 707.07(f) and 37 C.F.R. § 1.104, which state that the Examiner "must provide clear explanations of all actions taken by the examiner during prosecution of an application" and "where the applicant traverses any rejection,

the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it."

For at least this reason also, Applicant submits that the Examiner has failed to assert a proper rejection under 35 U.S.C. § 102, and that claim 6 should be allowed to issue.

c. The Li and Singh References Fail to Render Claims 3, 7-12, 14, 17, 18, 21, 23, and 25-27 Obvious.

In the last Office Action, the Examiner rejected claims 3, 7-12, 14, 17, 18, 21, 23, and 25-27 under 35 U.S.C. § 103(a) as being unpatentable over Li in view of "PAMAS – Power Aware Multi-Access Protocol with Signaling for Ad Hoc Networks" (Singh).

As set forth on pages 8-14 of the Office Action, the Examiner exclusively relied upon the Li reference to disclose the claim limitations directed to the station "determining a first backoff interval by measuring an average wait time that the first station incurred during pervious access attempts..." and "once....the shared resource first becomes available, the first station refraining from contending for access to said resource for at least an interval substantially equal to the first backoff interval." For at least the reasons noted above, Applicant submits that the Li reference fails to disclose what the Examiner relied upon the reference as disclosing, and thus, the Examiner can not establish a *prima facie* case of obviousness. The Singh reference does not compensate for the failed disclosures of the Li reference, as set forth above. In particular regard to claims 8 and 18, Li also fails to disclose the access point "distribute[ing] the first backoff interval value to the station," wherein the first backoff interval is determined by the access point by "measuring an average wait time that the access point incurred during a plurality of previous attempts to access the shared resource." (emphasis added). As set forth above, the access point of Li estimates a backoff window by monitoring attempts by other stations to access the shared medium, not the access point itself, and therefore fails to disclose the above-cited claim

limitations. The Singh reference does not compensate for the failed disclosures of the Li reference in this regard.

For at least these reasons, Applicant submits that the Examiner can not establish a prima facie case of obviousness under 35 U.S.C. § 103, and that claims 3, 7-12, 14, 17, 18, 21, 23, and 25-27 should be allowed to issue.

Specifically regarding claims 3, 8, 14, 18, 23, 26, and 27, as set forth on pages 8-14 of the Office Action, the Examiner conceded that Li failed to disclose or suggest "after the first backoff period is determined, the first station powering down a receiver circuit for at least a portion of said first backoff interval while the first station is refraining from contending for access to the shared resource," and instead exclusively relied upon the Singh reference for purportedly suggesting in Section 2.1 "IEEE 802.11 nodes [] power down when prevented from accessing the resource."

Applicants respectfully submit that, first and foremost, there is simply no teaching or suggestion in Li or Singh, alone or in combination, to power down a transmitter during a back-off interval when a station has pending transmissions. As set forth in paragraph [0006] of Applicant's disclosure, stations traditionally continuously monitored a transmission medium during the backoff interval to determine whether the channel was idle or not. This is because, as set forth in paragraph [0007] of Applicant's disclosure, the backoff countdown process would halt when a stations wait for access to a shared resource was interrupted by other stations and begin again only when shared resource had been idle for another interframe space. For at least this reason, Applicants submit that one of ordinary skill in the art would not have applied Singh's disclosure of powering down a transmitter to a back-off interval.

Furthermore, Applicants respectfully disagree with the Examiner's characterization of the Singh disclosure as disclosing "IEEE 802.11 nodes [] power down when prevented from

accessing the resource." As set forth in Section 2.1 of the Singh reference, "nodes transmit their requests to the base station during specific reservation intervals and the base station transmits a TIM (Traffic Indication map) that includes the transmission schedule for the nodes. All nodes not participating in transmission or reception of packets go into doze mode until the next reservation period." Accordingly, if a node has no pending data to send to the base station (i.e., no reservation request sent to the base station and thus the node is not participating in transmission of packets), and the base station has no pending data to send to the node (as indicated by the TIM), the node may go to sleep until the next reservation period.

However, the pending claims explicitly require that "the first station powering down a receiver circuit" (claim 3) "desires access to the shared resource and the shared resource…becomes available" (claim 1). Thus, although Applicant does not concede that one of ordinary skill would have combined the Li and Singh references, even if the references were combined, the combination would not render the pending claims obvious. More specifically, Singh teaches powering down the receiver and transmitter when there are no pending data transmissions between the base station and the node. Any combination of Singh with Li would still result in a node that powers down the receiver and transmitter only when there are no pending data transmissions between the base station and the node. In contrast, the pending claims explicitly require that the first station desires access to the shared resource and that the shared resource has become available. In this situation, the combination of Li and Singh would not place the node into a sleep state.

The Examiner has failed to cite any evidence beyond Singh that would lead one of ordinary skill in the art to the currently claimed invention. For at least this reason also, Applicant submits that the Examiner has failed to assert a *prima facie* case of obviousness under 35 U.S.C. § 103, and that claims 3, 8-12, 14, 18, 21, 23, and 26-27 should be allowed to issue.

6. Conclusion

Applicant submits that, for at least the forgoing reasons, all claims are currently in condition for allowance, and respectfully request that a notice thereof be sent. Should the Examiner wish to discuss this case, the Examiner is invited to call the undersigned at (312) 913-0001.

Respectfully submitted,
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